

## WHAT IS CLAIMED IS:

1. A method for analyzing performance of a large-scale network supervisory system, where configuration of a supervisory-system network which is a performance analytical object has a supervisory equipment, and a plurality of supervisory object devices connected to and supervised by said supervisory equipment, said method comprising the steps of:

enabling a user to input to an input device network configuration information on said supervisory-system network, device performance information regarding said supervisory equipment and said supervisory object devices, and data traffic patterns associated with said supervisory equipment and said supervisory object devices;

storing in a model storage section via said input device said network configuration information in which a function of said network configuration is combined as a sub-model, and said device performance information;

storing in a parameter storage section by means of said input device said device performance information and said data traffic patterns;

activating a performance evaluation section by said input device to acquire information regarding said data traffic patterns from said parameter storage section;

preparing a generation schedule of packets generated by said supervisory equipment and said supervisory object devices;

analyzing performance of each of said packets correspondingly associated with said supervisory equipment or said supervisory object devices; and

calculating approximate calculation value in a case where said sub-model to be analyzed, which has been acquired from said model storage section, is a sub-model to be subjected to approximate

- 30 calculation, calculating performance value in a case where said sub-model is a sub-model on which no approximate calculation is performed, and outputting to an evaluation result output device performance analytical results by combining said approximate calculation value and said performance value.

2. A method for analyzing performance of a large-scale network supervisory system according to claim 1, wherein in said step of storing in said parameter storage section, said section stores performance values and setup values, said performance values  
5 including a rate of processing performed between said supervisory equipment and said supervisory object devices, and a rate of a communication buffer and a network, and said setup values with respect to a traffic including a frequency of administration messages and data amount exchanged between said supervisory equipment and  
10 said supervisory object devices.

3. A method for analyzing performance of a large-scale network supervisory system according to claim 1, wherein said sub-model is a supervisory object device if said data traffic patterns are assumed to be performance evaluation.

4. A method for analyzing performance of a large-scale network supervisory system according to claim 1, wherein said approximate calculation is a performance-degradation calculation for bus arbitration executed in the Ethernet.

5. A method for analyzing performance of a large-scale network supervisory system according to claim 1, further comprising the steps executed in said performance evaluation section, said steps including;

performing in a queuing analytical section queuing simulation by  
5 inputting connection information on the queuing, and performance  
information regarding packet arrival intervals and a service rate;

outputting from a queuing analytical section a packet processing  
time, and a utilization factor and a queue length of each queue;

holding in an approximate calculation section a functional  
10 algorithm and a conversion table used for performing approximation  
on performance value including a delay time of a model, and  
outputting an approximate value of the performance value to be  
obtained for the input; and

calculating in a performance evaluation controller in accordance  
15 with information from said approximate calculation section, said  
model storage section, and said parameter storage section, by utilizing  
said approximate calculation section for portion of a model to be  
simulated by the approximate calculation, and by using said queuing  
analytical section for other portions, performance analytical results by  
20 combining analytical values from associated two kinds of modules.

6. A method for analyzing performance of a large-scale network  
supervisory system according to claim 5, wherein in said calculating  
step performed by said performance evaluation controller, said  
controller administers the time associated with a generation schedule  
5 of packets as a virtual time in the simulation.

7. A method for analyzing performance of a large-scale network  
supervisory system according to claim 5, wherein said performance  
evaluation controller executes a statistical processing including  
calculations for obtaining a mean value, a maximum value, a  
5 minimum value, and a standard deviation of the results obtained by  
processing the packets.

8. A method for analyzing performance of a large-scale network supervisory system according to claim 1, wherein said evaluation result output device displays the amount of money required for a system construction, by inputting said performance analytical results  
5 obtained in said performance evaluation section, and a price of a supervisory system to be evaluated that has been calculated by a device cost calculation section from said network configuration information stored in said model storage section and price information associated with each component of the network configuration.

9. A method for analyzing the performance of the large-scale network supervisory system according to claim 8, wherein said device cost calculation section holds configuration information on various network devices including various computers, hubs, and routers  
5 constituting the supervisory network, and price information regarding said components, and calculates the amount of money required for constructing the supervisory system from the number of devices and its performance, said devices being used in said sub-model held in said model storage section.

10. A method for analyzing performance of a large-scale network supervisory system according to claim 1, wherein said evaluation result output device inputs said performance analytical results obtained by said performance evaluation section, and  
5 suggestions for improvements to be outputted by a model configuration advisory section in a case where there is any portion which requires improvements, in accordance with said performance analytical results, and displays a location where a bottle neck exists and said suggestions for improvements.

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11. A method for analyzing performance of a large-scale network supervisory system according to claim 10, wherein said model configuration advisory section checks whether or not a model is valid on the basis of said performance analytical results obtained by said  
5 performance evaluation section, and outputs if there is any sub-model regarded as a bottle neck, a location where the bottle neck exists and suggestions for improvements.

12. A system for analyzing performance of a large-scale network supervisory system comprising:

an input device for enabling a user to input network configuration information on a supervisory system network, device  
5 performance information regarding a supervisory equipment and supervisory object devices, and data traffic patterns associated with said supervisory equipment and said supervisory object devices;

a model storage section for storing via said input device said network configuration information in which a function of said network  
10 configuration is combined as a sub-model, and said device performance information;

a parameter storage section for storing said device performance information, and said data traffic patterns by means of said input device; and

15 a performance evaluation section for acquiring information on said data traffic patterns from said parameter storage section activated by said input device, for preparing a generation schedule of packets generated by said supervisory equipment and said supervisory object devices, for analyzing performance of each packet  
20 correspondingly associated with said supervisory equipment or said supervisory object devices, and for calculating approximate calculation

value in a case where said sub-model to be analyzed, which has been acquired from said model storage section, is a sub-model to be subjected to approximate calculation, calculating performance value in  
25 a case where said sub-model is a sub-model on which no approximate calculation is performed, and outputting to an evaluation result output device performance analytical results by combining said approximate calculation value and said performance value.

13. A system for analyzing performance of a large-scale network supervisory system according to claim 12, wherein said parameter storage section stores performance values and setup values, said performance values including a rate of processing performed between  
5 said supervisory equipment and said supervisory object devices, and a rate of a communication buffer and a network, and said setup values with respect to a traffic including a frequency of administration messages and data amount exchanged between said supervisory equipment and said supervisory object devices.

14. A system for analyzing performance of a large-scale network supervisory system according to claim 12, wherein said sub-model is a supervisory object device if said data traffic patterns are assumed to be performance evaluation.

15. A system for analyzing performance of a large-scale network supervisory system according to claim 12, wherein said approximate calculation is a performance degradation calculation for bus arbitration executed in the Ethernet.

16. A system for analyzing performance of a large-scale network supervisory system according to claim 12, wherein said performance

evaluation section comprises a queuing analytical section for performing queuing simulation by inputting connection information on the queuing, and performance information regarding packet arrival intervals and a service rate;

a queuing analytical section for outputting a packet processing time, and a utilization factor and a queue length of each queue;

an approximate calculation section for holding a functional algorithm and a conversion table used for performing approximation on performance value including a delay time of a model, and outputting an approximate value of the performance value to be obtained for the input; and

a performance evaluation controller for calculating, in accordance with information from said approximate calculation section, said model storage section, and said parameter storage section, by utilizing said approximate calculation section for portion of a model to be simulated by the approximate calculation, and by using said queuing analytical section for other portions, performance analytical results by combining analytical values from associated two kinds of modules.

17. A system for analyzing performance of a large-scale network supervisory system according to claim 16, wherein said performance evaluation controller administers the time associated with a generation schedule of packets as a virtual time in the simulation.

18. A system for analyzing performance of a large-scale network supervisory system according to claim 16, wherein said performance evaluation controller executes a statistical processing including calculations for obtaining a mean value, a maximum value, a minimum value, and a standard deviation of the results obtained by processing the packets.

19. A system for analyzing performance of a large-scale network supervisory system according to claim 12, wherein said evaluation result output device displays the amount of money required for a system construction, by inputting said performance analytical results  
5 obtained in said performance evaluation section, and a price of a supervisory system to be evaluated that has been calculated by a device cost calculation section from said network configuration information stored in said model storage section and price information associated with each component of the network configuration.

20. A system for analyzing performance of a large-scale network supervisory system according to claim 19, wherein said device cost calculation section holds configuration information on various network devices including various computers, hubs, and routers constituting  
5 the supervisory network, and price information regarding said components, and calculates the amount of money required for constructing the supervisory system from the number of devices and its performance, said devices being used in said sub-model held in said model storage section.

21. A system for analyzing performance of a large-scale network supervisory system according to claim 12, wherein said evaluation result output device inputs said performance analytical results obtained by said performance evaluation section, and suggestions for  
5 improvements to be outputted by a model configuration advisory section in a case where there is any portion which requires improvements, in accordance with said performance analytical results, and displays a location where a bottle neck exists and said suggestions for improvements.



22. A system for analyzing performance of a large-scale network supervisory system according to claim 21, wherein said model configuration advisory section checks whether or not a model is valid on the basis of said performance analytical results obtained by said performance evaluation section, and outputs if there is any sub-model 5 regarded as a bottle neck, a location where the bottle neck exists and suggestions for improvements.